

The US Army's Center for Strategy and Force Evaluation

STUDY REPORT
CAA-SR-93-16

FOUNDATION 93

INFORMATION WAR ISSUES WORKSHOP

DECEMBER 1993



PREPARED BY
STRATEGY AND PLANS DIRECTORATE

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13. ABSTRACT (Maximum 200 words) This report describes the proceedings and key insights of the Information War (IW) issues workshop. The workshop was conducted to further develop the conceptual framework for IW and explore issues and their implications for the US Army. Workshop objectives were as follows: better define IW concept; examine implications of IW for strategy, doctrine, senior Army leadership decision-making, analysis, and modeling; explore impact of IW on training, organization, materiel, and operations; identify differences between IW and information warfare; and, identify candidate Army IW issues for upcoming Two Star Symposium (February 1994). The workshop issues were examined from different levels of Army organization (tactical, operational, theater strategic, and strategic-national) in a forum of recognized IW experts. Principal issues identified were: relate the command and control warfare (C2W) pillars (operational security, electronic warfare, deception, physical destruction, and psychological operations) to the battlefield operating systems (BOS); relate the C2W pillar-BOS resultant to workshop objectives; and, define IW and identify differences between IW and information warfare.				
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**FOUNDATION 93
INFORMATION WAR ISSUES WORKSHOP**

December 1993

Prepared by

**STRATEGY AND PLANS DIRECTORATE
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MAJ Gary L. Jackson, Team Member**

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24 FEB 1994

MEMORANDUM FOR Major General Ronald E. Adams, Deputy Chief of Staff
for Operations and Plans, Director of Requirements,
ATTN: DAMO-FDZ, Washington, DC 20310-0400

SUBJECT: FOUNDATION 93 Information War Issues Workshop

1. The US Army Concepts Analysis Agency's Conflict Analysis Center and the Information Warfare Office (DAMO-FDN) conducted an Information War Issues Workshop on 10 November 1993. The purpose of the workshop was to further develop the conceptual framework for Information War and explore issues and their implications for the US Army.
2. This final report documents the results of the workshop and our analyses. Included is an executive summary which provides an overview of the entire workshop. Questions and/or inquiries should be directed to Chief, Conflict Analysis Center, US Army Concepts Analysis Agency, 8120 Woodmont Avenue, Bethesda, MD 20814-2797, DSN 295-1680.
3. I would like to express my appreciation to all the staff elements and agencies which have contributed to the workshop.

E. B. VANDIVER III
Director



FOUNDATION INFORMATION WAR ISSUES WORKSHOP

STUDY
SUMMARY
CAA-SR-93-16

THE REASONS FOR PERFORMING THE WORKSHOP were to further develop the conceptual framework for Information War (IW) and explore issues and their implications for the US Army.

THE WORKSHOP SPONSOR was the Information Warfare Office, Office of the Deputy Chief of Staff for Operations and Plans (DAMO-FDN).

THE WORKSHOP OBJECTIVES were to:

- (1) Better define IW concept.
- (2) Examine implications of IW for strategy, doctrine, senior Army leadership decisionmaking, analysis, and modeling.
- (3) Explore impact of IW on training, organization, materiel, and operations.
- (4) Identify differences between IW and Information Warfare.
- (5) Identify candidate Army IW issues for upcoming Two Star Symposium (February 1994, Fort Belvoir, VA).

THE SCOPE OF THE WORKSHOP was to explore IW issues and their implications for Headquarters, Department of the Army, and Army components of unified/specified commands through year 2000.

THE BASIC APPROACH used in this workshop is an iterative structure that has three sequential phases: preprocessing, workshop execution, and postprocessing.

(1) Principal issues were identified during the preprocessing phase. In order to approach the issues from different levels of Army organization, workshop participants were divided into four teams: tactical, operational, theater strategic, and strategic-national.

(2) Teams were charged with responsibilities and demands which forced them to address the issues in a disciplined manner, examining the issues within the assigned moves. Preliminary insights were initially identified in team meetings and gained credence during the plenary session. During postprocessing, Key Insights were identified.

THE PRINCIPAL FINDINGS of the workshop were 17 Key Insights which provided a basis for additional planning actions required to improve and expand IW development. The Key Insights are listed below. They are grouped as components of concept, policy, and doctrine. A more detailed account of each is in the executive summary and the main report.

(1) Concept

- (a) Broad impact of IW
- (b) Strategy as a driver for command and control warfare (C2W)/IW
- (c) Commander's intent
- (d) IW rules of engagement
- (e) IW fratricide

(2) Policy

- (a) Government-wide planning and execution
- (b) Looking two generations ahead to leverage technology
- (c) Digitization, horizontal integration, and emerging technologies
- (d) IW impact on battlefield operating systems
- (e) IW architecture
- (f) Army strength in psychological operations and deception
- (g) Intelligence data bases and collection capabilities

(3) Doctrine

- (a) Role of doctrine in IW
- (b) IW Army regulations
- (c) Commander's concept of operations
- (d) Integrated staff function of C2W
- (e) New control measures

THE ORGANIZATION OF THE WORKSHOP was conducted by Ms. Rosie H. Brown, Conflict Analysis Center, Strategy and Plans Directorate, US Army Concepts Analysis Agency.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-SPC, 8120 Woodmont Avenue, Bethesda, MD 20814-2797.

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FOUNDATION 93
INFORMATION WAR ISSUES WORKSHOP
EXECUTIVE SUMMARY

THE WORKSHOP DESIGN was structured to examine tough IW issues not previously critically examined in an assembled forum of recognized IW experts. The workshop was based on IW senior Army leadership guidance.

THE WORKSHOP METHODOLOGY is contained in a three-step process which is summarized in Figure 1.

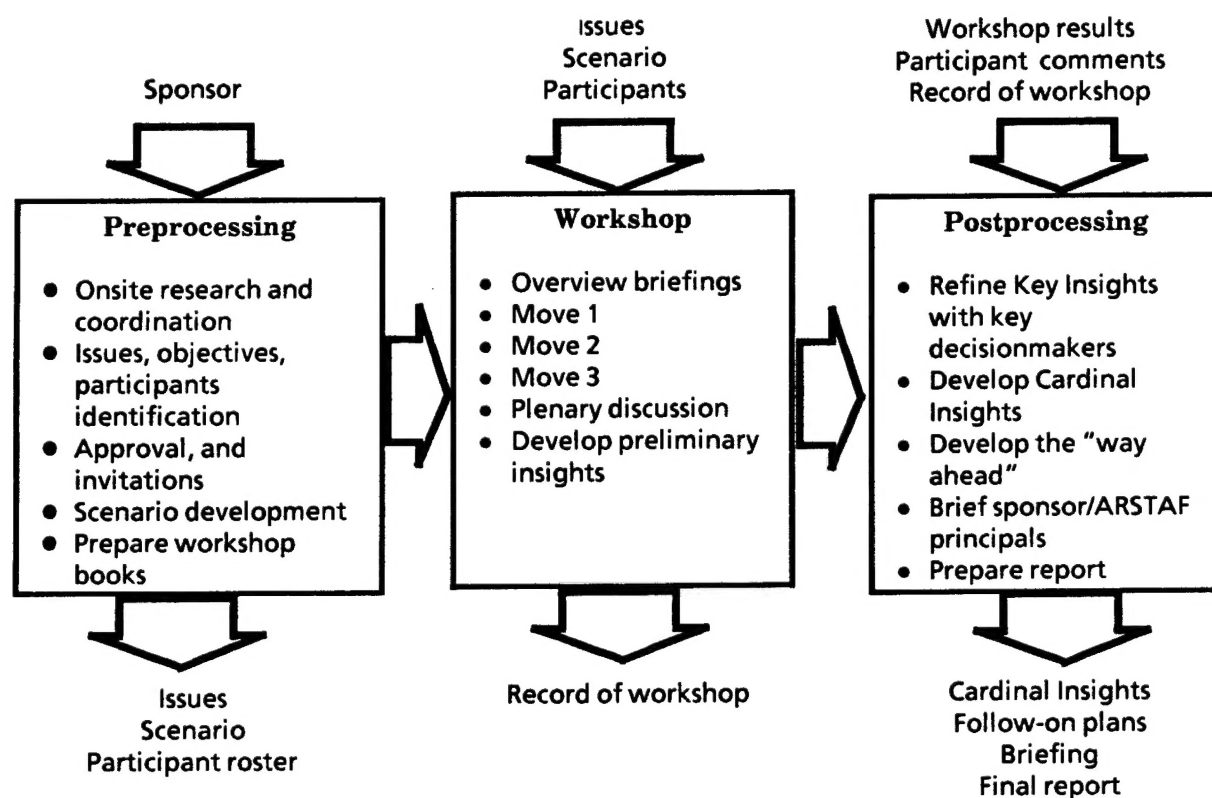


Figure 1. Information War Issues Workshop Methodology

PRINCIPAL ISSUES were identified and captured in a three-move workshop following IW overview information briefings. In order to approach the issues from different levels of Army organization, workshop participants were divided into four teams: tactical, operational, theater strategic, and strategic-national (see Figure 5). The teams examined the issues within the assigned moves. Move 1 related the command and control warfare (C²W) pillars (operational security (OPSEC), electronic warfare (EW), deception, physical destruction, and psychological operations (PSYOP)) to the battlefield operating systems (BOS). Move 2 related the

C2W pillar-BOS resultant to workshop objectives (dimensions of military forces: strategy, doctrine, senior Army leadership and decisionmaking, training, organization, materiel, and operations). Move 3 defined Information War and identified differences between Information War and Information Warfare.

Preliminary Insights were extracted from the results of the moves and attendant discussion, and these were briefed immediately after the workshop to a Senior Council led by BG Adams, Director of Requirements, Office of the Deputy Chief of Staff for Operations and Plans. A summary of the workshop issues is given in Figure 2. (Note: the use of the term "C2W pillars" was used prior to and throughout the workshop. However, during the postprocessing phase, subject matter experts determined that the term "C2W disciplines" more accurately describes the concept than "C2W pillars." Therefore, throughout the remaining sections of this report, the term C2W pillars will be replaced by C2W disciplines.)

WORKSHOP ISSUES

- **Move 1 - Relate pillars of C2W to BOS**

Examine impact and implications of C2W pillars (OPSEC, EW, deception, physical destruction, PSYOP) and other military capabilities that contribute to and influence C2W on operating systems at each level of war (strategic, theater-strategic, operational, tactical).

- **Move 2 - Relate C2W Pillar/BOS Resultant to Dimensions of Military Forces**

Examine impact and implications of Move 1 results on: strategy, doctrine, senior Army leadership and decisionmaking, training, organization, materiel, and operations.

- **Move 3 - Define Information War Concept**

Generate a clear, concise and accurate definition for IW; identify differences between IW and Information Warfare.

Figure 2. Summary of Workshop Issues

FOUNDATION 93 PARTICIPANTS represented the following:

a. Federal Agencies:

- Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS)
- Office of the Deputy Chief of Staff for Intelligence (ODCSINT)
- Office of the Director of Information Systems for Command, Control, Communication, and Computers (ODISC4)
- Training and Doctrine Command (TRADOC)

- Combined Arms Command (CAC)
- US Army Information Systems Command and Fort Huachuca (USAISC&FH)
- US Army Field Artillery Center at Fort Sill (USAFACFS)
- US Army Signal Center and Fort Gordon (USASC&FG)
- US Army Special Operations Command (USASOC)
- Intelligence and Security Command (INSCOM)
- Communications and Electronic Command (CECOM)
- Information Systems Command (ISC)
- Army Materiel Command (AMC)
- Army War College (AWC)
- Army Space and Strategic Defense Command
- National Defense University (NDU)
- US Army Research Laboratory (ARL)
- US Army Studies and Analysis Activity (USASAA)
- US Army John F. Kennedy Special Warfare Center and School (USAJFKSWC)
- US Army Intelligence Center and Fort Huachuca (USAIC&FH)
- Army Science Board
- Information Warfare Office (DAMO-FDN)
- US Army Concepts Analysis Agency (CAA)

b. Associated Contractors:

- JB Systems
- Engineering Support Company
- Science Application International Corporation (SAIC)
- Armed Forces Communications and Electronics Association (AFCEA)
- Dynamics Research Corporation
- Management Technology

SUMMARY OF KEY INSIGHTS. FOUNDATION 93 produced 17 Key Insights which provide a basis for additional planning actions required to improve and expand IW development. Issues were identified that were essential for developing Army IW/C²W. Key Insights are grouped as components of concept, policy, and doctrine. A detailed account of each is in the main report.

● **CONCEPT:**

- Information War (IW) impacts all players--adversaries, friendlies, and neutrals.
- C²W/IW strategic courses of action and objectives must drive C²W, not the reverse.
- The commander's intent must maximize IW to achieve command and control (C²) effectiveness.
- Articulate IW rules of engagement (ROE); faulty ROE can sabotage IW opportunities.
- High potential for fratricide exists across IW elements and between IW and other strategies.

● **POLICY:**

- IW requires government-wide planning and execution. These may be facilitated by a broad-based, high-level interagency coordinating committee.
- Senior Army leadership must look two generations ahead to leverage rapidly evolving technologies.
- Invest in digitization, horizontal integration, and emerging technologies.
- C2W is pervasive across all battlefield operating systems.
- Develop an IW architecture that ensures information supremacy.
- Exploit current Army C2W strengths in PSYOP and deception.
- Enhance existing intelligence data bases and collection capabilities; currently, they do not fully support C2W.

● **DOCTRINE:**

- Doctrine is best vehicle for integrating IW.
- Institutionalize IW in Army Regulation(s) (AR) 525 series and test in context of Louisiana Maneuvers.
- Commander's concept of operations must synchronize IW.
- Make C2W an integrated battle staff function at echelons above corps (EAC), corps, division, and joint task forces (JTFs).
- Need new battlefield control measures, such as electronic phase lines for combat operations.

THE WORKSHOP IMPACTS: Key Insights learned from FOUNDATION 93 Information War Issues Workshop will provide a baseline from which to expand and improve IW. The workshop will sustain a continued dialogue between key HQDA and personnel involved in IW development. The workshop provided an active interface between IW Senior Army Leadership and workshop participants to consider tough IW issues not previously critically examined in an assembled forum. Finally, the workshop generated frank and open discussion of critical issues in a favorable environment.

MAIN REPORT

Section I. INTRODUCTION

1. BACKGROUND. In February 1993, the Director, CAA, requested that CAA's Conflict Analysis Center conduct an Information War Issues Workshop to gain more knowledge of the IW concept. The workshop concept and candidate issues were approved in March 1993. The concept was briefed to Army Staff (ARSTAF) principals and refined to reflect ARSTAF guidance. In October 1993, DAMO-FDN offered to cosponsor the workshop with CAA. The analytical concept of operation for FOUNDATION 93 consists of three phases. This Issues Definition Workshop was conducted as Phase I. The primary focus was to identify and examine IW issues and concepts and their implications to the Army. During Phase II, an Issues Analysis Workshop will be conducted to refine and analyze IW issues identified in Phase I. A series of political-military games will be executed during Phase III to explore implementation, outcomes, and desired end states of options identified in the previous issues workshops. Insights gained will be integrated into the Army's current warfighting decisionmaking strategies. The FOUNDATION 93 Game Plan is shown in Figure 3.

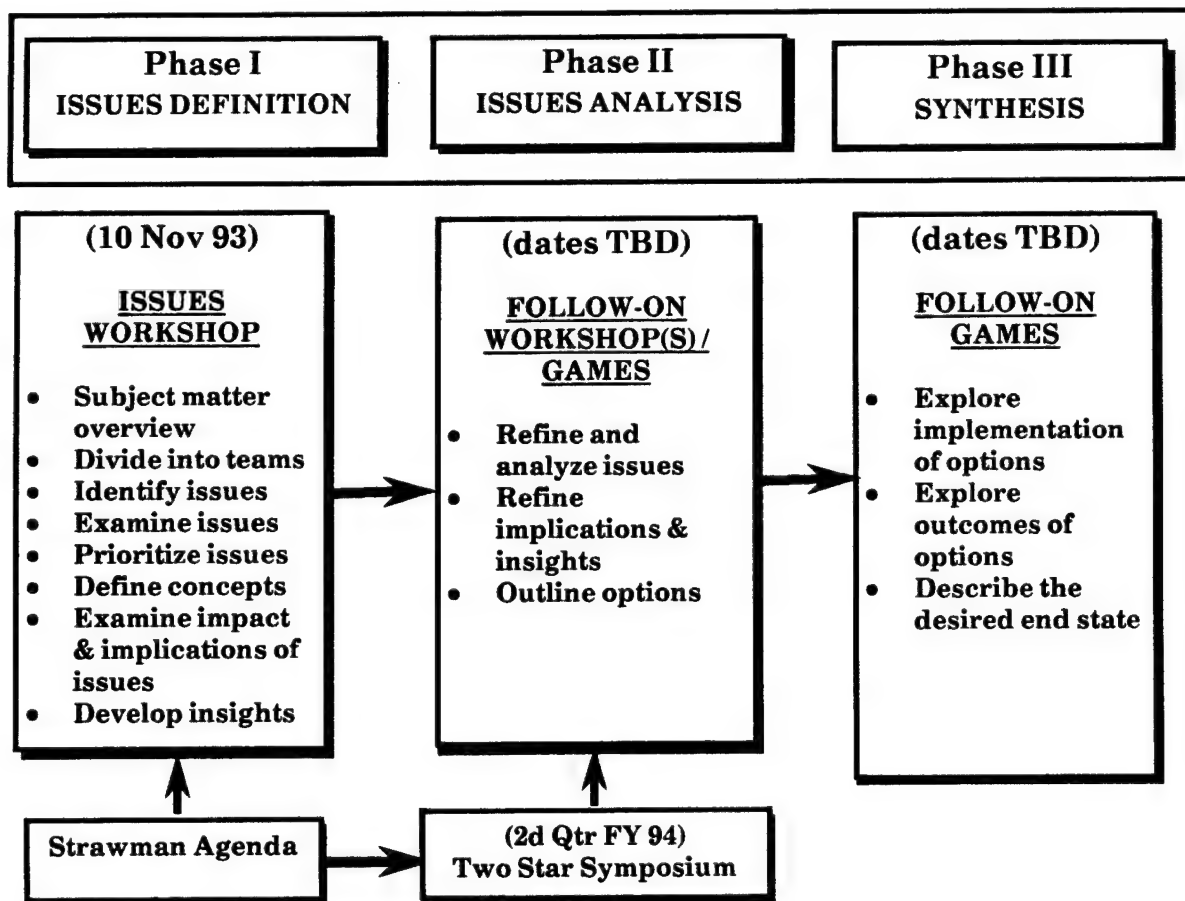


Figure 3. FOUNDATION 93 Game Plan

2. SCOPE. To explore IW issues and their implications for HQDA and Army components of Unified/Specified Commands through the year 2000.

3. OBJECTIVES. Five principal objectives were identified during workshop preprocessing:

- Better define IW concept.
- Examine implications of IW for strategy, doctrine, senior Army leadership decisionmaking, analysis, and modeling.
- Explore impact of Information Warfare on training, organization, materiel, and operations.
- Identify differences between Information War and Information Warfare.
- Identify candidate Army IW issues for Two Star Symposium (February 1994, Fort Belvoir, VA).

4. CAA's ISSUES WORKSHOP METHODOLOGY

a. Overview

(1) The following is a general discussion of CAA's issues workshop methodology. This approach is easily tailored to support specific issues workshops conducted by CAA's Conflict Analysis Center (CAC).

(2) Issues workshops are conducted by CAA to assist US Army major commands, Army components of the US unified commands, and the Army Staff to identify factors relevant to an impending decision. They are developed in direct coordination with the sponsor and they focus on key questions involving policy formulation and decisionmaking by the senior Army leadership. Results from issues workshops often provide the first step in analysis by identifying, defining, and prioritizing issues based on the sponsor's needs, and clarifying policy development and decisionmaking.

(3) State-of-the-art issues workshops are a principal methodology used by CAA. Experts apply their professional experience by responding to specific charges within the dynamic environment of a scenario. A scenario provides a well-defined structure and context for issue analysis. Issues workshops are usually 1 day and consist of a series of moves managed by controllers who synthesize expert opinions with sponsor requirements, ensure adequacy of issue treatment, and prepare key insights from the workshop. Key insights are refined immediately and presented personally to the sponsor for further comment and refinement.

b. Issues Workshop Structure. The CAC has developed an iterative structure to assure successful issues workshops that has three sequential phases: preprocessing, workshop execution, and postprocessing, as shown in Figure 4. During the preprocessing phase, candidate issues are identified. Then, based on these candidate issues, a realistic scenario, which emphasizes the criticality of decisions concerning the issues, is developed. The participants are then organized into teams to provide alternative perspectives of the key real-world elements that would actually impact on the issues. Finally, the teams are charged with responsibilities and demands which force them to address the issues in a disciplined manner.

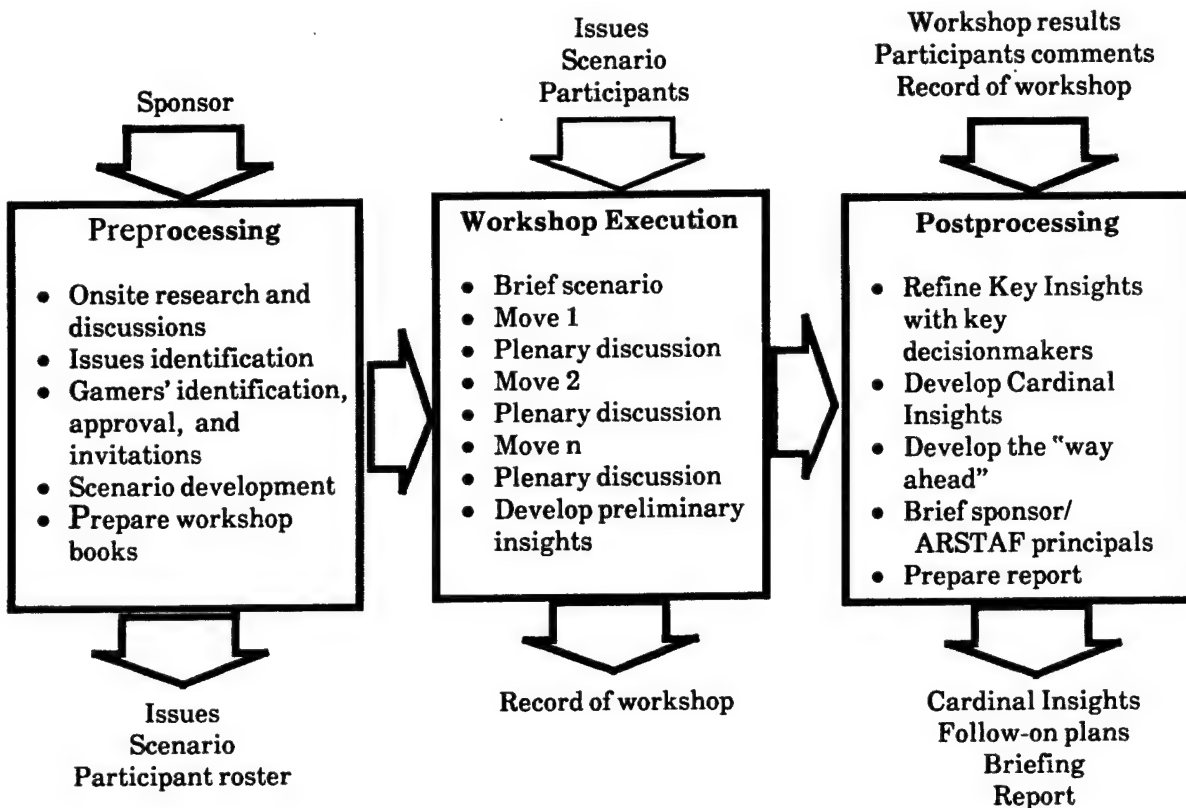


Figure 4. CAA's Issues Workshop Process

(1) **Preprocessing.** Preprocessing takes the conventional form of a discussion that yields concept definition. Ideally, this process is initiated by an Army component commander, member of the Army's senior leadership, Army Staff principal, or a noted expert. The Center can, and has, initiated preprocessing prior to an organized dialogue with a workshop's sponsor in order to determine if an issue merits further research and development. Bottom line is that the sponsor knows best what he needs to accomplish his mission, and the Center's objective is to assist. This assistance is best provided when the sponsor or his principal staff officer requests an issues workshop. Sponsor requests initiate research. Whenever possible, this is conducted onsite at the sponsor's headquarters or staff agency.

(a) **Onsite Research and Discussions.** There is no substitute for direct, on-site research and discussion with the commander and his principal staff. Continuous coordination is provided by a principal staff officer who also participates in each of the issues workshops. This direct coordination facilitates subsequent coordination trips with in-process reviews with the sponsor through workshop report completion.

(b) **Issues Identification.** An initial set of candidate issues is generated by research during the concept definition stage of the workshop. Critical issues are usually provided by the sponsor directly. Generally, issue generation is a

synchronous process with final approval of the issues residing with the sponsor. Participants are identified during the issues identification phase.

(c) Workshop Design. Once issues are identified, the issues workshop is tailored to explore each issue within context of the sponsors' objectives. The workshop design consists of participant selection and assignment, the scenario, moves, and the charges within each move.

1. Participant Roster. Participants and team leaders are identified by the sponsor during onsite research and candidate issue identification.

2. Workshop Scenario. The scenario, which sets the context within which the participants must operate, is part of the critical foundation of the workshop and a key driver in focusing the participants on the issues from a common and relevant perspective. Accordingly, a significant amount of effort is expended in the preprocessing phase in order to ensure that the scenario is as realistic as possible and provides information that is relevant to the issues to be examined. Frequently, the scenario describes a future situation in which the participants are tasked to assume specific functions. The demands which are placed upon the participants in these situations force them to examine the issues.

3. Workshop Moves. The number of moves of the workshop are dictated by the scope, structure, and complexity of the problem posed by the sponsor, and the relationships among the issues that have been identified. Each move consists of a set of questions, called charges, to be answered by each team.

(2) Workshop Execution. Participants are welcomed, introduced, and then briefed on the scenario before beginning the workshop.

(a) Scenario Briefing. While participants are familiar with various aspects of the subject area being explored, they will not be familiar with the specific scenario developed for a particular workshop. Controllers are familiar with every aspect of the scenario, the issues being analyzed, and anticipated results. Usually controllers have conducted a practice session with the Workshop Director.

(b) Workshop Dynamics. After the scenario briefing and explanation of the issues, participants are presented Move 1 for discussion and resolution. A move is initiated by the Chief Controller, and it is sustained by controllers and analysts assigned to each team. The issues for a move are presented as a "charge" to a team and consist of a series of questions designed to deal with the sponsor's approved issues. Teams respond to charges under the direction of team leaders and the guidance of controllers. Usually, 3 hours are adequate for total treatment of a move. Typically, during the moves, teams meet separately. First, team members are provided written requirements for each move and tasked to develop individual answers. Second, teams develop collective answers and responses to charges. Third, the team leader or a Center-provided briefer/recorder briefs the team's results to a plenary session attended by the Workshop Director, all participants, controllers, observers, and the sponsor. This presentation and discussion in plenary session signals the completion of a move, if the Chief Controller and Workshop Director concur.

(c) Preliminary Insights. Preliminary insights are an important real-time product of the workshop. These insights are first identified in the team discussions of a particular move and then gain credence and acceptance during the

rigorous plenary discussions and Senior Council Briefings. During this dialogue, controllers synthesize expert opinions with sponsor requirements to ensure adequacy of issue treatment and then prepare preliminary insights. Insights remain preliminary until validated further by supporting analysis and postprocessing.

(d) **Record of Proceedings.** The CAC prepares a nonverbatim, not-for-attribution written record of proceedings in the form of a CAA memorandum report on all workshops. This report contains Key Insights from the workshop and provides the sponsor a complete accounting of all phases of the workshop.

(3) Postprocessing

(a) Postprocessing accelerates the exploitation phase of the issues workshop methodology. Key Insights are refined during postprocessing into Cardinal Insights. Cardinal Insights are those with broadest range of application. This refinement begins with a briefing to the Senior Council and continues with executive decisionmakers.

(b) Three especially important products refined during this phase are a review and agreement on the workshop impact assessment, review of scenarios generated by the workshop, and consensus on the steps that should be taken next to maximize benefits of the workshop.

(c) Issues workshops may be replicated to consider changing circumstances. One productive approach has been to first conduct a workshop to identify issues and conduct issues analysis, and then, after analysis of the Key Insights, conduct a political-military game. An important advantage is participation by members of the commander's principal staff which assures higher operational utility. Advantages are also readily recognizable in conducting an operationally focused game at the commander's headquarters followed by a Washington-based game.

Section II. FOUNDATION 93 IW ISSUES WORKSHOP OVERVIEW

5. PREPROCESSING. In February 1993, the Director, CAA made the decision to conduct an Information War Issues Workshop. The workshop concept was approved in March 1993.

a. Onsite Research and Discussions. Onsite research was conducted over a period of approximately 6 months in coordination with the cosponsor and other ARSTAF principals. Coordination and joint planning sessions were conducted with DAMO-FDN in October and November 1993.

b. Issues Identification. Principal issues were identified while structuring the workshop design in February and March 1993. Final resolution and specification of workshop issues and participants identification were conducted with the sponsor.

c. Workshop Design. The workshop was designed and executed as a three-move workshop. It was organized to reflect IW issues and requirements at different levels of Army organization by dividing workshop participants into four teams (tactical, operational, theater strategic, and strategic-national).

(1) Workshop Roster. The IW issues workshop participants (see Appendix A) represented the following federal agencies and associated contractors:

a. Federal Agencies

- Office of the Deputy Chief of Staff for Operations and Plans
- Office of the Deputy Chief of Staff for Intelligence
- Office of the Director of Information Systems for Command, Control, Communication, and Computers
- Training and Doctrine Command
- Combined Arms Command
- US Army Information Systems Command and Fort Huachuca
- US Army Field Artillery Center at Fort Sill
- US Army Signal Center and Fort Gordon
- US Army Special Operations Command
- Intelligence and Security Command
- Communications and Electronic Command
- Information Systems Command
- Army Materiel Command
- Army War College
- Army Space and Strategic Defense Command
- National Defense University
- US Army Research Laboratory
- US Army Studies and Analysis Activity
- US Army John F. Kennedy Special Warfare Center and School
- US Army Intelligence Center and Fort Huachuca
- Army Science Board
- Information Warfare Office
- US Army Concepts Analysis Agency

b. Associated Contractors

- JB Systems
- Engineering Support Company
- Science Application International Corporation
- Armed Forces Communications and Electronics Association
- Dynamics Research Corporation
- Management Technology

(2) Workshop Scenario. The workshop scenario set the parameters within which the participants operated. The scenario follows.

(a) Technologies developed to support the Persian Gulf conflict proved to be a vital margin that saved lives and helped achieve victory. The Gulf War demonstrated that efficient management of information increased the pace of combat operations, improved the decisionmaking process, and synchronized various combat capabilities.

(b) The downsizing of military forces and the shrinking defense budget have resulted in increased reliance on efficient management of information, technological innovations and command, control, communications, computers, and intelligence (C4I). The battlefield commander must have access to all information

needed to win in war and that information must be provided when, where, and how the commander wishes.

(c) The challenge facing Department of the Army (DA) is to maintain maximum flexibility and balance in force structure and capabilities while staying within reduced manpower and funding levels. In order to "do more with less" DA must "do things smarter." Increasing emphasis must be placed on joint operations, collaboration with allies, and advanced C4I technologies. To meet this challenge, the Army must continue to modernize by upgrading in the near term and initiating selective new systems, despite building down to a smaller force.

(d) The time has come to describe and set a course toward future warfighting capabilities. The Army's modernization vision provides our direction and focus. A key objective is to "win the battlefield Information War." The purpose of this workshop is to explore Information War issues and their implications for the US Army.

(e) To facilitate discussion, there are four teams representing the strategic, theater-strategic, operational, and tactical levels of war. Each team addressed IW issues at their particular level. Teams related the five disciplines of C2W and other issues to BOS. Next, teams related these results to the workshop objectives. Finally, teams generated a definition for Information War, and differentiated between Information War and Information Warfare. To facilitate Senior Council Review of results, teams considered prioritizing issues.

(3) Workshop Moves. Workshop moves are discussed below. Although team members were familiar with the various aspects of IW/C2W, they were challenged by the workshop charges. The methodology represented a different way of looking at the problem and addressing the issues.

(a) Move 1, Charge 1. The objective of Army C2W is to maximize the capability of US and allied forces by establishing and maintaining a decisive C2 advantage over any adversary. Relate the five "disciplines" of C2W to the BOS. To facilitate workshop discussion, refer to BOS identified in the handouts provided (draft of TRADOC Pamphlet 11-9, Blueprint of the Battlefield, 21 May 92).

- What is the impact and the implications of C2W disciplines on the BOS?
The five disciplines are: OPSEC, EW, deception, physical destruction, and PSYOP.

(b) Move 1, Charge 2. The five "disciplines" of C2W do not exclude the use of other measures that would contribute to C2W objectives under specific circumstances (i.e., sustainment, etc.).

- Identify other military actions/capabilities that contribute to C2W objectives.
- What is the impact and the implications of these military actions on the BOS?

(c) Move 2, Charge 1. Examine the impact and implications of Move 1 on the workshop objectives (dimensions of military forces) listed below: strategy, doctrine, senior Army leadership and decisionmaking, training, organizations, materiel, and operations.

(d) Move 3, Charge 1. Use the results of Move 1 and Move 2 to describe the relationships between Information War and Information Warfare.

- Generate a clear, concise and accurate definition for Information War.
- Using the unclassified definition for Information Warfare that has been provided, identify the difference (if any) between Information War and Information Warfare.

(e) In addition to the three moves, teams were charged with identifying candidate Army IW issues for review during the Two Star Symposium (February 1994, Fort Belvoir, Virginia).

6. WORKSHOP EXECUTION. Key aspects of the conduct of the workshop follow.

a. Workshop Introduction and Orientation. Participants were welcomed by Mr. E. B. Vandiver III, Director, CAA. Information briefings were given that addressed the status of IW in the Army and the concept of C²W and provided the workshop's approach, intended accomplishments, and background details to assist the participants throughout the workshop. See Appendix C - Workshop Overview; Appendix D - Army C²W Concept.

b. Workshop Dynamics. After introductory briefs, participants were organized into teams where they addressed each move. Teams were all given the same charge, and each team addressed the moves from its organizational perspective (tactical, operational, theater strategic, and strategic-national). Teams met separately, except for plenary sessions. Moves were initiated by the controllers and sustained by CAA analysts assigned to each team.

(1) Organization. Participants (controllers, team leaders, team members) are a critical factor throughout the course of the workshop implementation. The workshop organization is displayed in Figure 5. Participants are also listed by team in Appendix A.

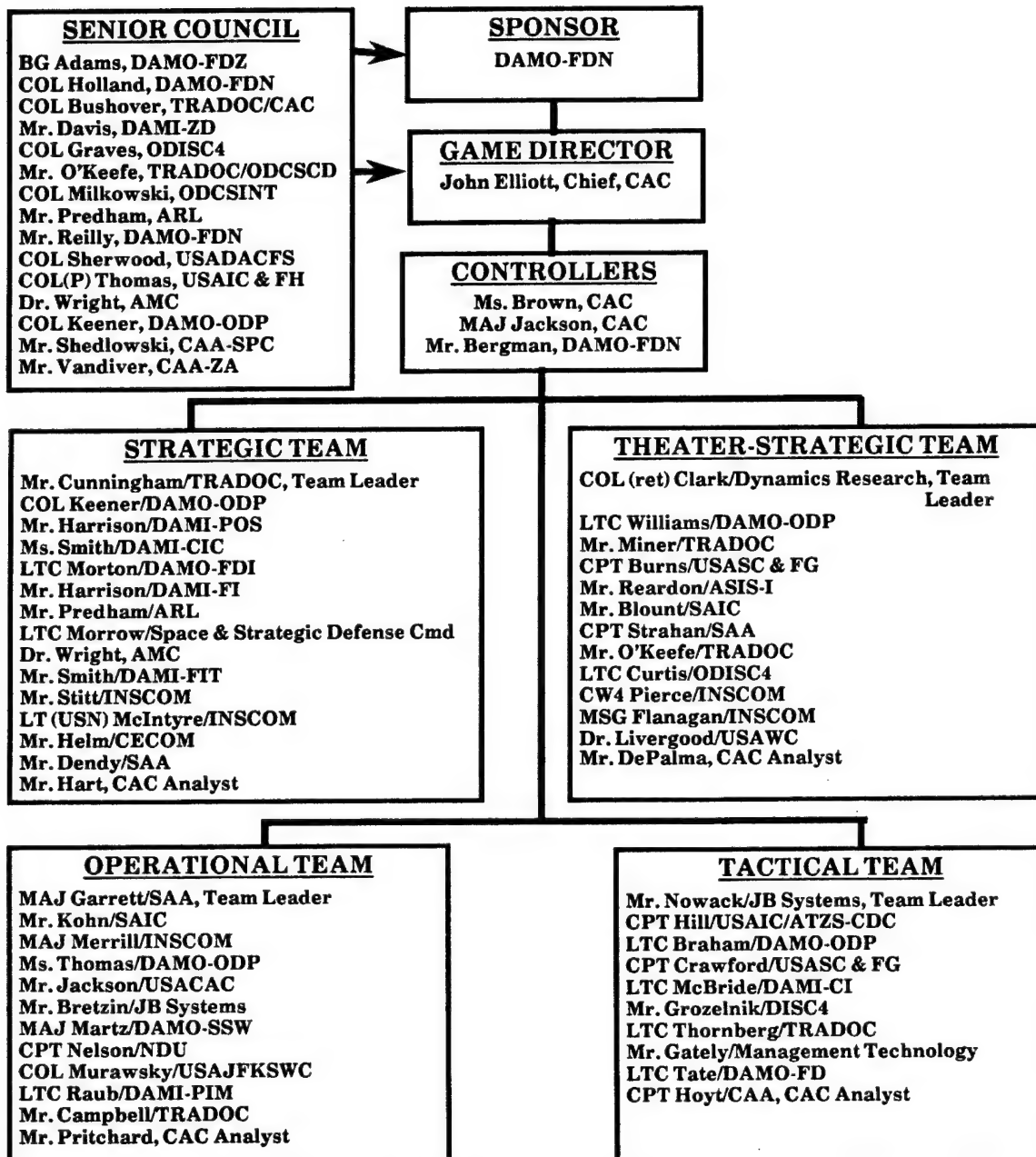


Figure 5. Workshop Organization

(2) **Addressing the Charges.** Team members were given a written handout on the specific issues for each move, and additional background information was provided upon request. See Figure 6 for the workshop concept. First, each team developed its collective answers under the direction of its team leader and the guidance of the CAA analyst. Second, teams developed their insights and prepared their results for the Senior Council Briefing plenary session. Each team's collective answers were briefed by the team leaders.

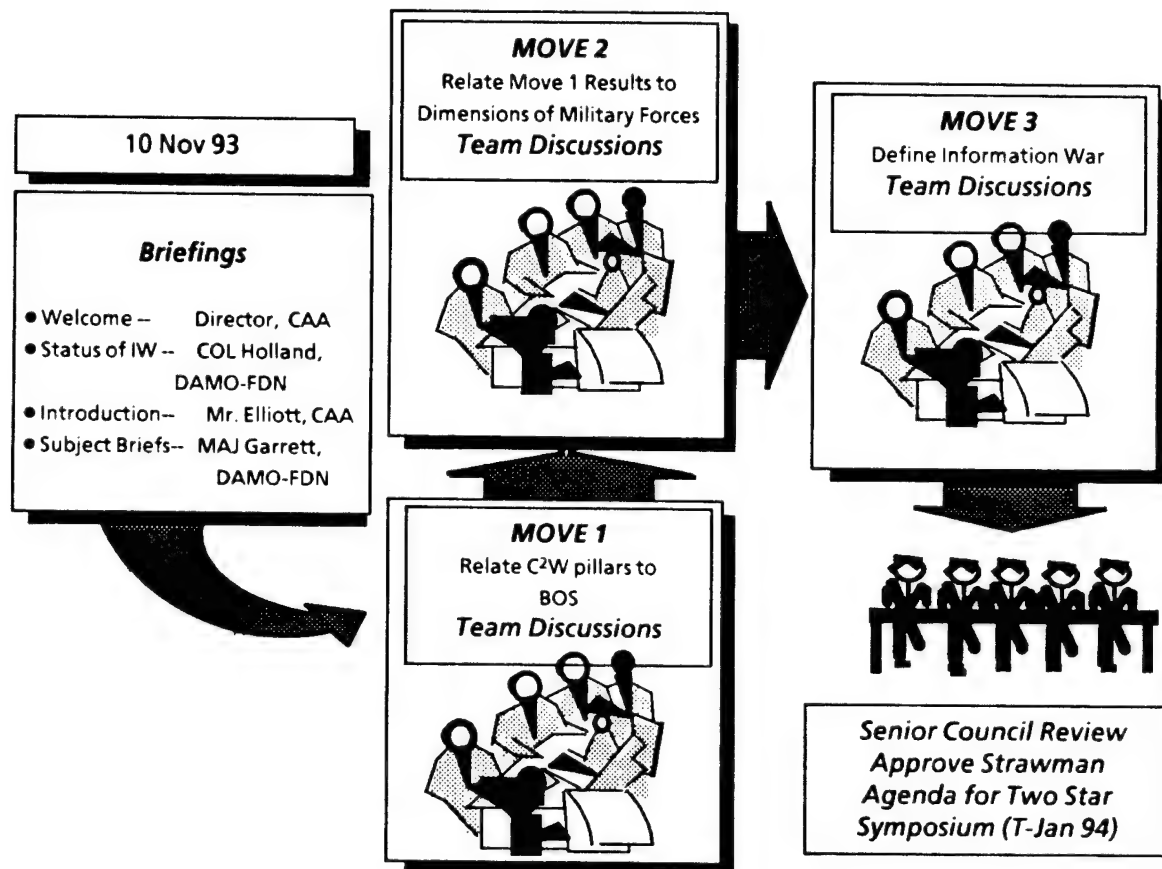


Figure 6. Workshop Concept

c. Postprocessing. Preliminary insights were initially identified in the team meetings and then gained credence and acceptance during the plenary session. Key Insights are identified in Section III.

Section III. KEY INSIGHTS

7. KEY INSIGHTS were generated from the answers to charges presented to the teams and the plenary group discussions. The following paragraphs list and explain those insights. The terms used by participants show that the definitional issues have yet to be resolved. Information War, Information Warfare, command and control warfare, and related expressions are, in practice, applied to the same concept.

a. Broad Impact of IW. The elements of Information War will be increasingly prominent facts of existence for all actors in regional or global issue arenas. Ever-increasing speed, technical means, variety, quantity, and distribution mark a new phase in the production and use of information. The globe is connected within and across national boundaries in practically all areas of activity. This new Information Age is the context within which current and future relations between actors of all kinds and at all levels on the international scene will be conducted, including war. Taken broadly, the causes, components, and consequences of war may be found in peacetime, through hostilities, and beyond. Therefore, the information aspect of war will also be found across this spectrum of time and relations. Actors will endeavor to influence the beliefs, values, and policies of the others through all available means and at all available levels of action, from individuals and tactical systems to chief of state. These means, or sinews, of Information War would include, at the forefront, the "disciplines" of command and control warfare (or their functional equivalents, depending on the level under consideration): psychological operations, deception, electronic warfare, destruction, and operational security. The focus will most likely be upon potential and actual adversaries. However, because of the growing global interconnectedness, the actual and potential Information War roles and influence of all actors, allied and neutral as well as adversaries, must be recognized. They occupy key terrain on the field of Information War. Their presence and impact, whether active, intermediary, or passive, must be expected and dealt with. The US can act on others or be acted upon by them, directly or indirectly, through any combination of the components of IW. To paraphrase: "You may not be interested in Information War, but Information War is interested in you."

BOTTOM LINE: Information War impacts all players--adversaries, friendlies, and neutrals.

b. Strategy as Driver for C²W/IW. Planning and direction at the strategic level set the context and parameters for lower echelons. The requirements of the highest level mission call for the necessary employment of those instruments with expected effectiveness, including the disciplines of C²W, at successively lower levels. Leaders at all echelons need to know the expected or desired results of strategic actions in order to assess the battlefield and frame their warfighting perspectives. To ensure accomplishment of the mission, the C²W disciplines must be synchronized with each other and with the battlefield operating systems at each level, tactical through strategic. Furthermore, finite resources must not be wasted on divergent or inconsistent courses of action. They must be marshalled and coordinated to work together and achieve mutually reinforcing effects to support the accomplishment of the higher, overriding strategy. A set of IW plans and means, without deliberate consideration of the higher organizing and orienting concept, is not a strategy and does not generate a coherent, purposive strategy.

BOTTOM LINE: Strategic courses of action and objectives must drive C²W, not the reverse.

c. Commander's Intent. Effective, rational use of military forces is dependent upon effective command and control. The new realities of IW include the fact that each discipline of C²W has potential for significant adverse or beneficial effects on the command and control BOS at each level, tactical through strategic. The linkage between C²W and BOS may be active or passive. The entire force must know IW and its implications. The commander has responsibility for taking the lead in making these new realities, and the attendant new imperatives of IW, clear and unequivocal in his statement of intent.

BOTTOM LINE: The commander's intent must maximize IW to achieve C² effectiveness.

d. IW ROE. The planners and executors of IW must know the limits of their actions, i.e., rules of engagement. In defining ROE imperatives and boundaries, one necessarily precludes certain types of action, sets thresholds beyond which actions (or components of action) may not go, or prescribes the form, nature, intensity, location, timeframe, or other characteristic or controlling factors. However, in developing and implementing ROE, there is potential for intentionally or inadvertently precluding or constraining the exercise of potentially lucrative IW strategies and actions. The ROE for each C²W discipline, for example, must be carefully and clearly formulated and articulated.

BOTTOM LINE: Articulate IW rules of engagement; faulty ROE can sabotage IW opportunities.

e. IW Fratricide. Higher-level objectives should determine the supporting strategies, including IW. Supporting strategy should not conflict with other supporting strategies and courses of action. The synchronization and integration of C²W mechanisms with the various BOS is needed to prevent intersystem and C²W-operational conflicts. Interoperability and compatibility should be fielded by design to reduce the potential for dysfunctions. Flexibility and efficiency in the ability to rapidly switch from one C²W discipline to another, across operations, will yield benefits. Furthermore, IW and C²W should be planned so that the advantages and disadvantages of various potentially competing or conflicting options are considered and the right choices made. While execution may be done by a single-service element, the need for joint planning and direction, particularly at operational level and higher, to achieve cooperative effort and avoid fratricide, is clear.

BOTTOM LINE: High potential for fratricide exists across IW elements and between IW and other strategies.

f. Government-wide Planning and Execution. The preceding findings and remarks concerning the criticality of the higher mission and strategy and the need to avoid fratricide point to necessary structural features for planning and execution. The formulation of a national level strategy, and the essential IW part of that strategy, mandates a coordinated effort at the highest levels. Interagency and inter-branch (i.e., legislative-executive) planning are unavoidable if coherent, rational IW is to be conducted. Agencies must not work at cross purposes. Limited resources must be used wisely in a mutually supportive way in pursuit of the common goal. This requirement for cooperation and mutual reinforcement applies at the execution level as well as at the planning level.

BOTTOM LINE: IW requires government-wide planning and execution. These may be facilitated by a broad-based high-level interagency coordinating committee.

g. Looking Two Generations Ahead to Leverage Technology. We must guard against developing the Army's future in the context of old thinking about warfare. Technologies, particularly in the area of information, are growing and spreading rapidly. Off-the-shelf systems capable of linking with and interfering with information networks are increasingly available to actual and potential adversaries. The worldwide integration of such systems, for example, the multinational sharing of common carriers, increases our own vulnerability to IW and C²W by such mechanisms. We must not be mired in the technology thinking of today. The Army must forecast, plan for, and take advantage of technology developments at least two generations in the future.

BOTTOM LINE: Senior Army leadership must look two generations ahead to leverage rapidly evolving technologies.

h. Digitization, Horizontal Integration, and Emerging Technologies. Resources are finite and limited. They must be employed with maximum efficiency and mutual support. Among these resources are new electronic capabilities which enable our forces to use widely dispersed digital computing (digitization) and super-high speed of data transfer, shared access to data, and integrated control (horizontal integration). The potential for efficiency and increased effectiveness from these developments may be enormous. Much new equipment is increasingly available off the shelf from the commercial/civilian sphere, where system development and life cycle times may be much shorter than previously experienced by the military. The Army must not lag in capitalizing on these systems.

BOTTOM LINE: Invest in digitization, horizontal integration, and emerging technologies.

i. IW Impact on BOS. The disciplines of C²W and their relationships with the BOS at all echelons, tactical through strategic, set down as horizontal and vertical components of a matrix, provide a useful starting framework for analysis of IW. Systematic review of these discipline-BOS relationships suggests several points. First, the nature of the relationships should be evaluated in terms of the effects on the "target:" exploitation, denial, deception, and destruction (others, such as disruption or degradation, may also be assessed). Second, each discipline has a recognizable, significant effect on practically every BOS at each echelon. IW, or its C²W aspect, touches every BOS at every level in some way. Third, EW was estimated by the Workshop to have the greatest impact in a generic, high-intensity type conflict, with C² as the most important BOS, and fourth, an additional discipline, public affairs/public information activities, should be considered.

BOTTOM LINE: C²W is pervasive across all battlefield operating systems.

j. IW Architecture. The Army must develop an information architecture of systems, organizations, and doctrine/tactics/procedures which ensures information dominance through the application of information technology. The potential for this new architecture should be fully integrated into and explored within our exercises, games, simulations, and models. Special attention may be required at the national strategic level. A key element of this architecture will be the soldiers. Therefore, the exploration of IW should be complemented by awareness of the necessity for IW

training at all levels. Integrated, joint use of simulations/models, and virtual environments facilitates better use of the Army's training dollars. Staff integration training should be provided early in an officer's career in order to properly employ C2W. Recommend specific training for officers beginning at CAS3 and continuing beyond Senior Service School.

BOTTOM LINE: Develop an IW architecture that ensures information supremacy.

k. Army Strength in PSYOP and Deception. The Army has firmly institutionalized its PSYOP capabilities in the form of established PSYOP organizations/units and a comprehensive, coherent doctrine. The Army must exploit its C2W strengths in PSYOP and deception when developing its IW strategy.

BOTTOM LINE: Exploit current Army C2W strengths in PSYOP and deception.

l. Intelligence Data Bases and Collection Capabilities. The Army needs to develop improved data bases, ADP assets, and hardened and redundant capabilities to protect our assets and enhance our warfighting abilities. We must be able to work in an environment where we are given incomplete data, while also striving for better and more complete intelligence information.

BOTTOM LINE: Enhance existing intelligence data bases and collection capabilities; currently, they do not fully support C2W.

m. Role of Doctrine in IW. The Army must build doctrine to better define and encompass IW/C2W. It must be fully integrated into all doctrine, at all levels. It is unlikely the Army will fight any future conflict alone. Joint doctrine is critically needed for the IW/C2W component of joint operations, especially at the theater-strategic level. IW/C2W should be expressed in "how to fight" manuals and in Field Manual (FM) 100-5. Current and existing documentation should be revised in relation to the C2W disciplines. To ensure thorough doctrine, it should be crosswalked with ARs, other existing doctrine, tactics, techniques, and procedures (TTP). During the time the revisions are taking place, senior Army leadership must provide guidance to the IW community. The Army must develop field manuals and supporting documentation on an accelerated timeline to ensure Army positions influence emerging joint doctrine initiatives.

BOTTOM LINE: Doctrine is best vehicle for integrating IW.

n. IW Army Regulations. Senior Army leadership must set the tone and criteria to emphasize the importance and impact of IW/C2W. They have an essential role in communicating to and educating the whole Army, top to bottom. They must address what is expected of the Army in the area of IW/C2W. There exists a need to develop a set of regulations for IW and test related issues and implications in the context of high-level exercises. Army leadership must establish those IW criteria which commanders are expected to meet. Commanders' evaluation criteria should include C2W.

BOTTOM LINE: Institutionalize IW in AR 525 series and test in context of Louisiana Maneuvers.

o. Commander's Concept of Operations. The commander's concept must successfully integrate C2W, supported by intelligence, with other operations at the onset, not as an afterthought. Improved and expanded integration of IW principles

into the commander's concept of how the operators will execute IW will be an incremental and iterative process. The Army needs to consider the requirement to establish IW units, either virtual or real. Commanders must be able to conceptualize the C2W disciplines. Adding a new IW section to the standard operation order (OPORD) would help convey the commander's intent on how to integrate IW into the overall operation.

BOTTOM LINE: Commander's concept of operations must synchronize IW.

p. Integrated Staff Function of C2W. C2W must be an integrated staff function. The Army must review the status of and requirement for the organic presence of each discipline on the battle staff at corps and division. One option may be to realign the staff structure to include individuals with discipline expertise under a single director, for example the G3. A revised staff structure may enhance discipline effectiveness by improved timeliness, reduced space/distance to operate, and consolidated functions.

BOTTOM LINE: Make C2W an integrated battle staff function at EAC, corps, division, and JTFs.

q. New Control Measures. The need for IW measures to support the overall strategy and avoid fratricide implies an appropriate, comprehensive, effective set of planning and operational mechanisms to ensure a coordinated effort.

BOTTOM LINE: Need new battlefield control measures, such as electronic phase lines for combat operations.

Section IV. PROPOSED DEFINITIONS

(INFORMATION WAR AND INFORMATION WARFARE)

8. PROPOSED DEFINITIONS for Information War were generated by the teams. The teams were provided an unclassified definition for Information Warfare and asked to identify differences (if any) between Information War and Information Warfare. The following paragraphs lists proposed definitions for both Information War and Information Warfare and presents other observations addressed by the teams.

a. Information War Definitions

(1) Prosecution of war by any means to decrease friendly uncertainty and time for decision and increase enemy uncertainty and time for decision, with consequent enhancement or degradation of control of respective forces.

(2) Information used to reduce uncertainty and reduce time within the commander's decision making process.

(3) State of engaging in conflict resulting from the gathering, use, and denial of information.

b. Information Warfare Definition. The collection, use, and denial of information to produce information dominance for the purpose of killing (soft or hard) quickly, winning decisively with no fratricide.

c. Observations. Information Warfare is the military strategy applied during periods of crisis or war. Information War is a constant process occurring at the national level, throughout periods other than war. It was recommended that the definition of Information War include C2, (communications), and C²W in order to make Information War and Information Warfare synonymous. Additionally, it was suggested that the Army interface with the Joint Staff in order to reduce terminology problems.

Section V. TWO STAR SYMPOSIUM ISSUES

9. TWO STAR SYMPOSIUM ISSUES were generated by the teams. Teams were charged with identifying candidate issues to be addressed at the Two Star Symposium in early February 1994 at Fort Belvoir, Virginia. The proposed candidate issues are as follows:

- a.** Relationship of IW to other strategies.
- b.** Institutionalizing the Army's role in government-wide IW planning and execution.
- c.** Best concept for an architecture for IW supremacy.
- d.** New AR 525 series regulations required to institutionalize IW.
- e.** Priorities for the Army's IW development plan.
- f.** Appropriate ROE for IW across the spectrum from peace through hostilities.

Section VI. WORKSHOP IMPACTS

10. WHAT WAS ACCOMPLISHED. FOUNDATION 93 Issues Workshop was conducted early in the IW conceptual framework planning and development. We assembled a representative group of recognized IW experts and designed an ambitious workshop as a precursor to an issues analysis workshop (T Mar 94), and a series of political-military games. FOUNDATION 93 examined IW issues not previously critically considered in an assembled forum and provided active interface between senior Army IW leaders and workshop participations. Finally, the workshop encouraged frank and open discussion in a favorable environment.

11. WHAT WE LEARNED. FOUNDATION 93 Issues Workshop was a superb first step to the process of expanding and improving upon IW. It identified essential ingredients for developing Army IW/C²W in the areas of concepts, policy, and doctrine.

12. WHERE DO WE GO FROM HERE. This Issues Identification Workshop was conducted as Phase I of FOUNDATION 93. This report of the workshop proceedings will be made available to all participants of the Two Star Symposium. Candidate Two Star issues identified by this workshop will be addressed by the symposium participants, and the results will serve as a catalyst and driver for the Issues Analysis Workshop in Phase II. Finally, a series of political-military games will be executed during Phase III. These games will explore implementation, outcomes, and desired end states of options identified in the previous issues workshops. Insights gained will be integrated into the Army's current warfighting decisionmaking strategies.

APPENDIX A

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APPENDIX B
BIBLIOGRAPHY

TRADOC Pam 11-9 (draft), Blueprint of the Battlefield, 21 May 1992
(UNCLASSIFIED)

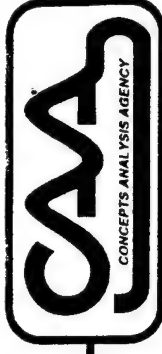
Chairman of the Joint Chiefs of Staff, Memorandum of Policy No. 30, Command and Control Warfare, 8 March 1993 (UNCLASSIFIED)

Army Regulation 525-25, Command and Control Countermeasures (C2CM), 31 July 1992 (UNCLASSIFIED)

Joint Pub 1-02, Department of Defense Dictionary of Military and Associated Terms, 1 December 1989 (UNCLASSIFIED)

Army Command and Control Warfare (C2W) Concept Statement Coordination Draft, Headquarters, Department of the Army, DAMO-FDN, 8 November 1993
(UNCLASSIFIED)

APPENDIX C
WORKSHOP OVERVIEW



UNCLASSIFIED

FOUNDATION 93

INFORMATION WAR ISSUES WORKSHOP

10 Nov 93

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UNCLASSIFIED

BACKGROUND

FOUNDATION 93

- Game concept defined Dec 92
- DAMO-SSP coordination 14 Jan, 8 Feb 93
- Workshop concept proposal 27 Feb 93
- Update Director, CAA 4 Mar 93
- DAMO-FDQ and DAMO-FDI coordination 12 -16 Apr 93
- Briefed to DAMO-FDI 30 Apr93
- Briefed to DAMI-PI 6 May 93
- Briefed to DAMI-PO 11 May 93
- Update Brief to DAMO-FDI 1 Jun 93
- Refine concept Jun-Oct 93
- Brief DAMO-FDN / FDN agrees to co-sponsor 12 Oct 93
- Joint planning session with DAMO-FDN 27 Oct 93
- Update Director, CAA 3 Nov 93



OBJECTIVES

FOUNDATION 93

- **Better define Information War concept**
- **Examine implications of IW for strategy, doctrine, senior Army leadership decision-making, analysis and modeling**
- **Explore impact of IW on training, organization, materiel, and operations**
- **Identify differences between Information War and Information Warfare**



GAME PLAN

FOUNDATION 93

Phase I ISSUES DEFINITION

(10 NOV 93)
ISSUES
WORKSHOP

- Subject matter overview
- Divide into teams
- Identify issues
- Examine Issues
- Prioritize issues
- Define concepts
- Examine impact & implications of issues
- Develop insights

Phase II ISSUE ANALYSIS

(dates TBD)
FOLLOW-ON
WORKSHOP(S) /
GAME(S)

- Refine & analyze issues
- Refine implications & insights
- Outline options

Phase III SYNTHESIS

(dates TBD)
FOLLOW-ON
GAME(S)

- Explore implementation of options
- Explore outcomes of options
- Describe the desired end-state

(2d Qtr FY 94)
2 STAR
SYMPOSIUM

STRAWMAN
AGENDA



INFORMATION WAR ISSUES WORKSHOP

FOUNDATION 93

PURPOSE: To further develop the conceptual framework for Information War and explore issues and implications for the US Army

GAMERS:

DISC4, J-33, ARSTAF, DCSINT, ARMY CAC, SIG CENTER, USASOC, DAMO-FDN, AMC, INSCOM, TRADOC, ARMY SPACE CMD, AWC/SSI, USAIC, AFCEA, SAIC, ARMY SCIENCE BOARD, J.B. ASSOCIATES, CAA

SPONSOR:

DAMO-FDN

SCOPE:

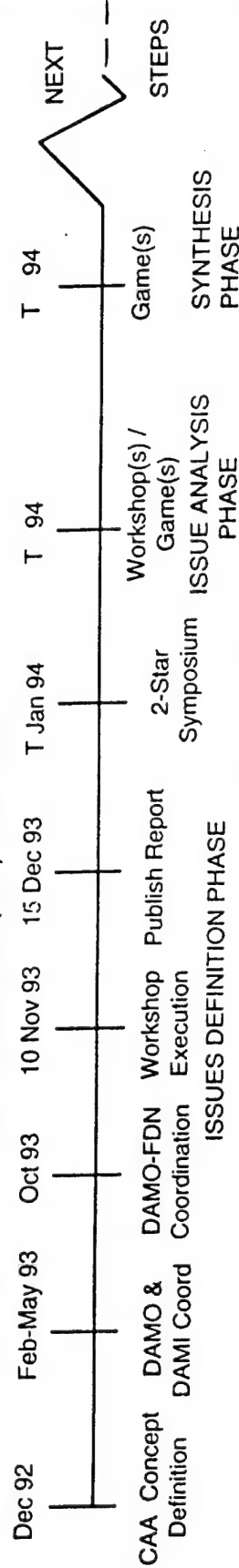
Explore Information War issues and their implications for HQDA and Army components of unified/specified commands through year 2000.

OBJECTIVES:

- Better define Information War concept
- Examine implications of IW for strategy, doctrine, senior Army leadership decision-making, analysis and modeling
- Explore impact of IW on training, organization, material, and operations
- Identify differences between Information War and Information Warfare

STUDY DIRECTOR:

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WORKSHOP METHODOLOGY

FOUNDATION 93

WORKSHOP RESULTS
GAMER COMMENTS
RECORD OF WORKSHOP

ISSUES
SCENARIO
GAMERS

SPONSOR

PRE-PROCESSING

- ON-SITE RESEARCH AND DISCUSSIONS
- ISSUES IDENTIFICATION
- GAMERS IDENTIFICATION, APPROVAL, AND INVITATIONS
- SCENARIO DEVELOPMENT
- PREPARE WORKSHOP BOOKS

ISSUES
SCENARIO
GAMER ROSTER

WORKSHOP

- BRIEF SITUATION
- MOVE 1
- PLENARY DISCUSSION
- MOVE 2
- PLENARY DISCUSSION
- MOVE 3
- PLENARY DISCUSSION
- DEVELOP PRELIMINARY INSIGHTS

RECORD OF
WORKSHOP

POST-PROCESSING

- REFINE INSIGHTS WITH KEY DECISION MAKERS
- DEVELOP CARDINAL INSIGHTS
- DEVELOP THE "WAY AHEAD"
- BRIEF SPONSOR/ARSTAF PRINCIPALS
- PREPARE REPORT

CARDINAL
INSIGHTS
FOLLOW-ON
PLANS
BRIEFING
REPORT



WORKSHOP CONCEPT

FOUNDATION 93

10 Nov 93

Briefings

- Welcome-- Director, CAA
- Status of IW-- COL Holland, DAMO-FDN
- Introduction-- Mr Elliott, CAA
- Subject Briefs--MAJ Garrett, DAMO-FDN

Move 2

Relate Move 1 Results to
Dimensions of Military Forces
Team Discussions



Move 1

Relate C2W pillars to
BOS
Team Discussions



Move 3

Define Information War
Team Discussions



Senior Council Review
Approve Strawman
Agenda for 2-star
Symposium (T-Jan 94)



ISSUES

FOUNDATION 93

MOVE 1

Relate pillars of Command and Control Warfare (C2W) to Battlefield Operating Systems (BOS)

Examine impact and implications of C2W pillars (OPSEC, EW, Deception, Physical Destruction, PSYOP) and other military capabilities that contribute to/influence C2W on operating systems at each level of war (strategic, theater-strategic, operational, tactical)



ISSUES

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MOVE 2

Relate C2W Pillar/BOS Implications to Dimensions of Military Forces

- Examine impact and implications of Move 1 results on:
 - Strategy
 - Doctrine
 - Senior Army leadership and decision-making
 - Training
 - Organization
 - Materiel
 - Operations



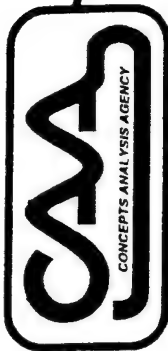
ISSUES

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MOVE 3

Define Information War Concept

- Assess, refine, and verify:
 - Comprehensiveness / scope
 - Components
 - Accuracy
 - Clarity
 - Detail
 - Consistency
 - Domain
 - Relationship to other concepts
- Operationalize / relate to tangible and measurable
- Identify any differences between Information War and Information Warfare



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APPENDIX D
ARMY COMMAND AND CONTROL WARFARE CONCEPT
INFORMATION BRIEFING



Army Command and Control Warfare (C2W) Concept Information Briefing

10 November 1993

DAMO-FDN

1



“The battlefield is a scene of constant chaos. The winner will be the one that best controls that chaos, both his and that of his enemy.”

Napoleon Bonaparte

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The Army C2W Concept- Intent

1. Provide a concept for executing Army command and control warfare (C2W) strategy:
 - all operating environments
 - Service, joint, and combined operations
2. Align Army C2W strategy with DoD policy on Information Warfare (IW) established in DoD Directive 3600.1 *Information Warfare*
3. Implement Service C2W responsibilities established in CJCS MOP 30, *Command and Control Warfare*
4. Acknowledge increasing importance of C2W by expanding the scope of C2 countermeasures to encompass the range of actions available to achieve decisive C2 superiority over an adversary



The Army C2W Concept- Scope

1. Defines roles, components, and principal military actions
2. Describes planning and implementation in Army operations
3. Establishes objectives and sets goals for implementation
4. Identifies impact on doctrine, training, leader development, organizations, material, and soldiers (DTLOMS)
5. Provides input for the Enhanced Concept Based Requirements System
6. Establishes responsibilities for principal Army commands and staff agencies



Definitions

Information Warfare (IW): The use of information in support of national security strategy to rapidly seize and maintain a decisive advantage by attacking an adversary's information infrastructure through exploitation, denial and influence, while protecting friendly information systems. Information warfare is implemented through national military strategy by command and control warfare.

Command and Control: The exercise of authority and direction by a properly designated commander over assigned or attached forces in the accomplishment of the mission. C2 functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in accomplishment of the mission.



Definitions

Command and Control System: The combination of personnel, equipment, communications, computers, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the assigned mission.

Command and Control Warfare (C2W): The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), and physical destruction, mutually supported by intelligence, to

- deny information to,
- influence,
- degrade,
- destroy adversary C2 capabilities while protecting friendly C2 capabilities against such actions.

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Definitions

Counter-C2: Those measures taken to prevent effective command and control of adversary forces by denying information to, influencing, degrading, or destroying the adversary command and control system.

C2- Protection: The division of C2W that seeks to deny, negate, or turn to friendly advantage, adversary efforts to destroy, disrupt, and/or deny information in the U.S. and allied C2 system, including its supporting communications, information, and intelligence activities.



Definitions

Node: An entity where personnel and equipment combine to implement C2 procedures in support of the commander's concept of operations.

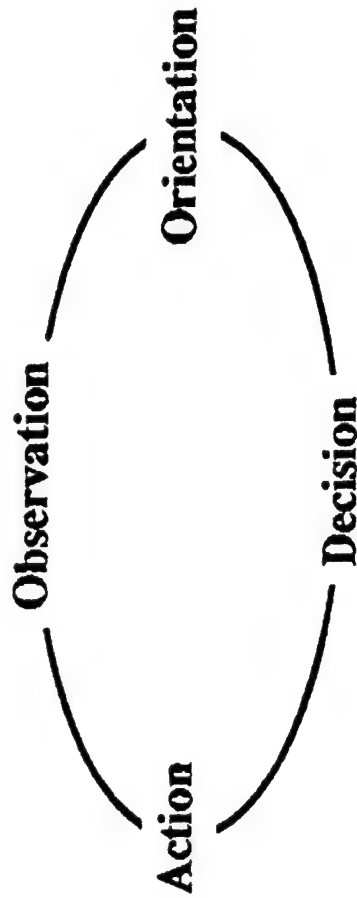
Critical Node: A node whose disruption or destruction immediately degrades the ability of a commander to command and control his forces.

Vulnerable Node: A node that is subject to disruption or destruction. To be vulnerable, a node must satisfy three criteria:

- **Susceptible:** The node has an exploitable weakness.
- **Accessible:** Friendly C2W systems can interdict the node.
- **Feasible:** The employment of C2W systems would result in a high payoff



Decision Cycle



Observation: The view of the battlefield obtained from intelligence collection. This intelligence establishes the basis for future actions.

Orientation: Based on intelligence and perception, the commander develops a vision of how the operation will unfold.

Decisions: Based on observation and orientation, the commander directs the publication of OPLANS and OPORDS.

Action: The execution by units of OPLANS and OPORDS.

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Rationale for C2W

C2 transforms military capability into combat power
C2W transforms an adversary's C2 into a target rich environment

Relative Combat Power = $\frac{\text{Realize full friendly combat power}}{\text{Prevent adversary's realization of combat power}}$

C2W includes: Counter-C2
C2-Protection

Combat Multiplier Effect = $\frac{\text{(Effective C2) (Effective C2- Protection)}}{\text{(Effective Counter- C2)}}$

Rationale for C2W is to maximize *relative* combat power of friendly forces through operations that ensure *C2 superiority (supremacy)*.

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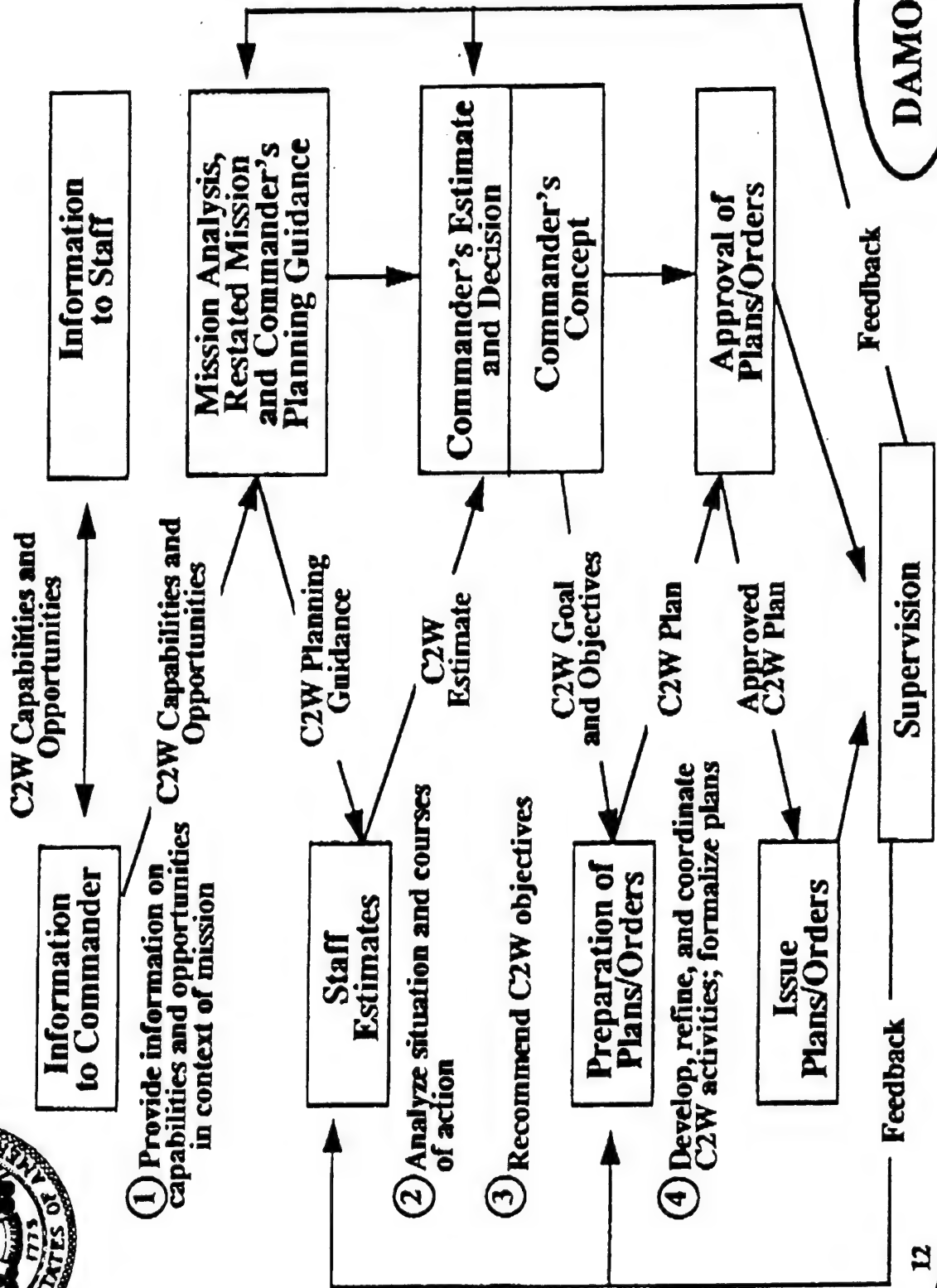
C2W and the Operational Continuum

The scope and options for employing C2W measures increases with the likelihood and intensity of conflict across the operational continuum

Army Mission	Deterrence Humanitarian Aid Peacekeeping	Counter-narcotics Counter-terrorism	Armed Conflict
C2W Objectives	Deny Information	Influence Degrade	Destroy
C2W Measures	Non-Destructive	Non-Lethal	Destructive Lethal

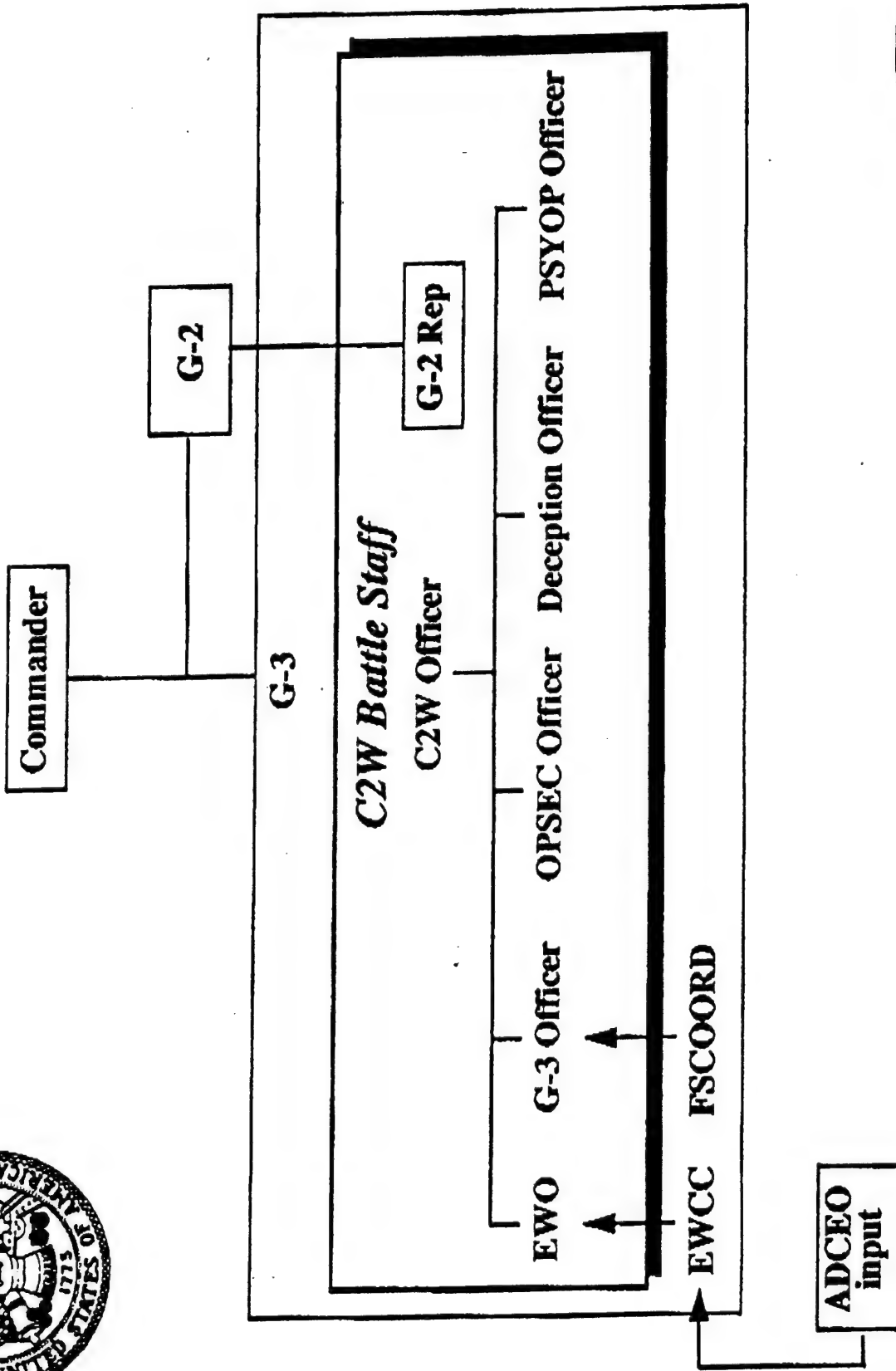


C2W Planning- Staff Planning Process





C2W Battle Staff - Div and Higher (Proposed)



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C2W Program Objectives

- Integrate the use of C2W strategy to maximize operational capability
- Develop C2W capabilities that are interoperable, compatible, and mutually supportive in joint and combined operations
- Integrate C2W planning and operations into exercises
- Train leaders at all levels to plan and exploit C2W capabilities
- Develop the capability to systematically evaluate the effect of C2W on:
 - friendly and adversary C2 systems and C2W systems
 - the outcomes of Army operations



C2W Concept Implementation

- Develop Army C2W doctrine and refine doctrine for OPSEC, PSYOP, military deception, and EW
- Develop and maintain C2W proficiency of forces in all operating environments
- Incorporate C2W planning into all operations and exercises via the G-3 C2W staff officer
- Develop and coordinate Army C2W tactics, techniques, and procedures based on adversary C2W capabilities
- Develop lethal and non-lethal C2W weapon systems and materiel IAW STAR and the TTSP
- Test C2W weapons systems and materiel in operating environments IAW the STAR and the TTSP



C2W Concept Implementation

- Identify C2W system vulnerabilities and prepare mission need statements (MNS) and Operational Requirement Documents (ORD), as required
- Develop and exercise the capability to provide intelligence support to C2W plans and operations in peacetime and war
- Develop a foreign C2W intelligence database to support C2W planning and operations



Summary

- Army C2W concept is operationally-oriented- *C2W is a warfighter's program!*
- Defines C2W as a supporting strategy
- Emphasizes the synergistic effect of combining C2W tools
- Proposes the creation/designation of the C2W Battle Staff and C2W staff officer
- Provides a framework for planning C2W operations
- Establishes C2W program goals

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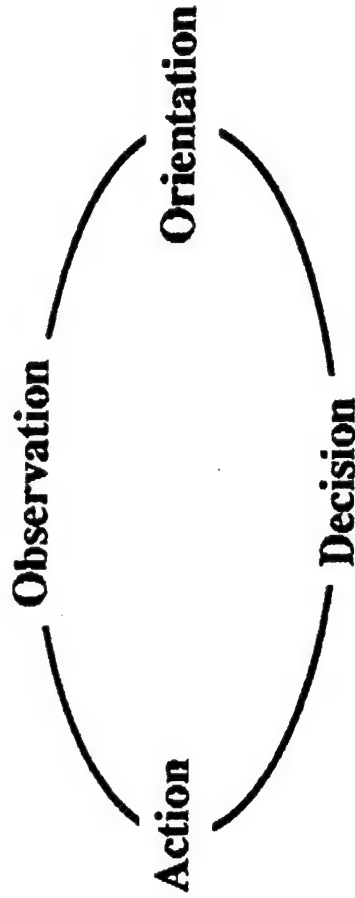
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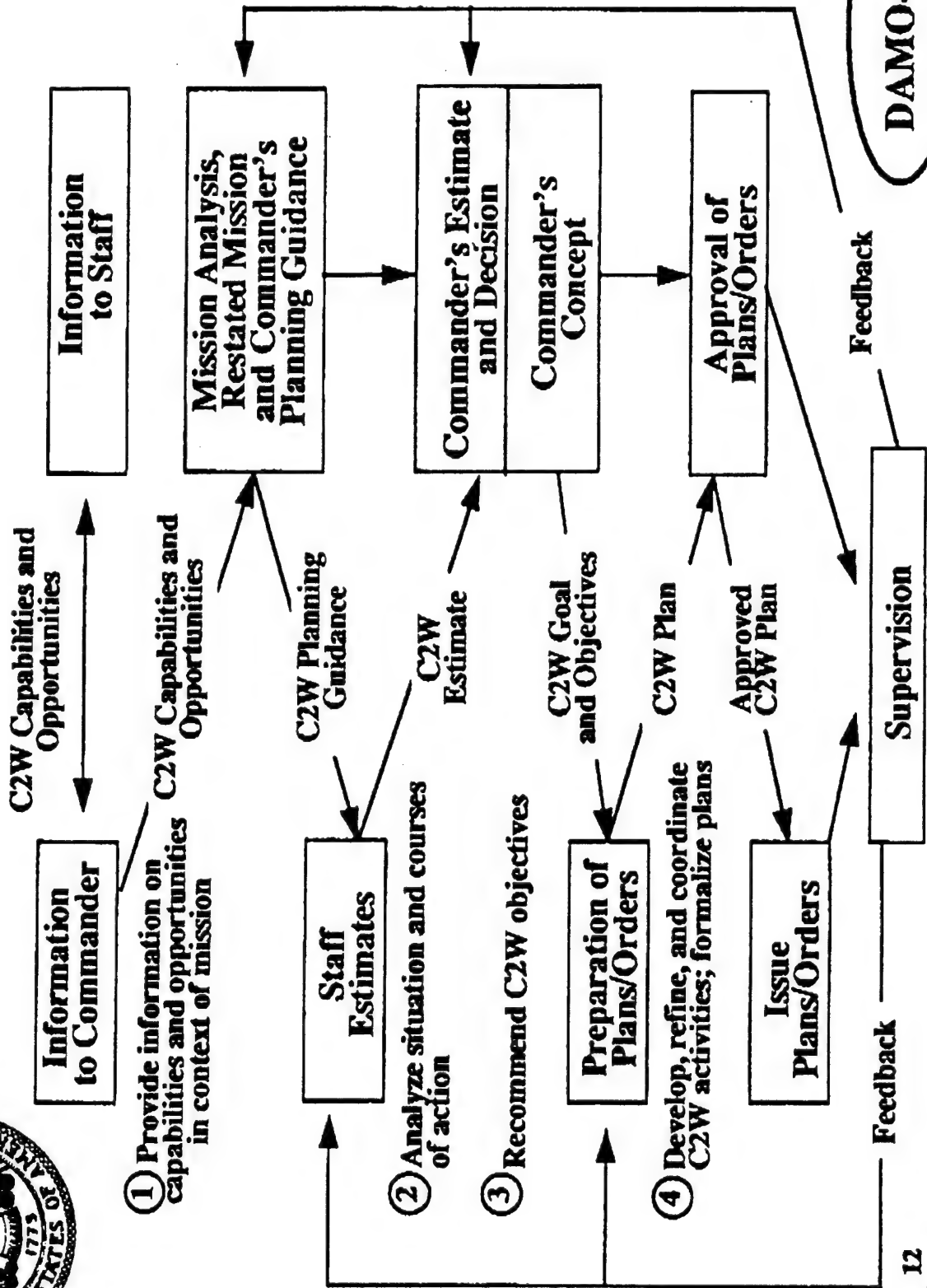
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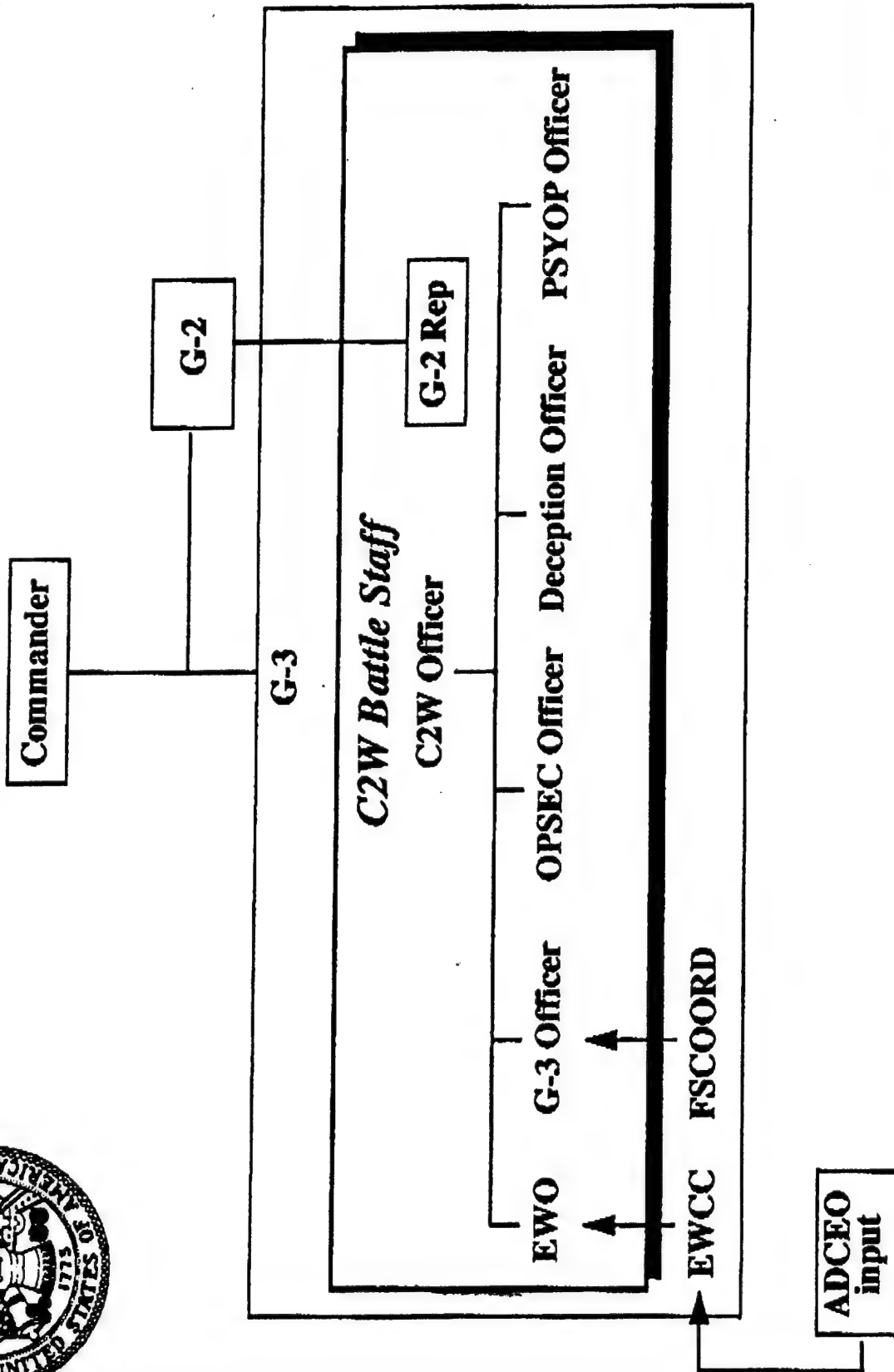


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